

WHAT IS CLAIMED IS:

1. A semiconductor device comprising:
 - a semiconductor substrate;
 - 5 a high-dielectric-constant film on the semiconductor substrate; and
 - a nitride layer on the high-dielectric-constant film.
- 10 2. The semiconductor device according to claim 1 further comprising a p-type impurity-contained layer on the nitride layer.
- 15 3. The semiconductor device according to claim 1 wherein the nitride layer is formed by introducing nitrogen into a top surface portion of the high-dielectric-constant film.
- 20 4. The semiconductor device according to claim 1 wherein the semiconductor substrate is a silicon substrate or a silicon layer.
- 25 5. The semiconductor device according to claim 2 wherein the p-type impurity-contained layer is a boron-contained silicon layer.
6. A method of manufacturing a semiconductor

device comprising the steps of:

forming a high-dielectric-constant film on a semiconductor substrate; and

forming a nitride layer over the top surface of the high-dielectric-constant film.

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7. The method according to claim 6 further comprising the step of forming a p-type impurity-contained layer on the nitride layer.

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8. The method according to claim 6 wherein the nitride layer is formed by introducing nitrogen into a top surface portion of the high-dielectric-constant film.

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9. The method according to claim 6 wherein the nitride layer is formed by introducing nitrogen into the top surface portion of the high-dielectric-constant film by plasma nitriding.

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10. The method according to claim 6 wherein the nitride layer is formed by introducing nitrogen into the surface portion of the high-dielectric-constant film by using radical nitrogen.

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11. The method according to claim 6 wherein the semiconductor substrate is a silicon substrate or a

silicon layer.

12. The method according to claim 7 wherein
the p-type impurity-contained layer is a boron-
5 contained silicon layer.

13. A semiconductor device comprising:
A semiconductor substrate;
a gate insulating film on the semiconductor
10 substrate; and
a gate electrode formed on the gate
insulating film and including at least a p-type
impurity-contained layer,
wherein the gate insulating film includes a
15 high-dielectric-constant film and a nitride layer on
the high-dielectric-constant film.

20 14. The semiconductor device according to
claim 13 wherein the nitride layer is formed by
introducing nitrogen into a top surface portion of the
high-dielectric-constant film.

25 15. The semiconductor device according to
claim 13 wherein the semiconductor substrate is a
silicon substrate or a silicon layer.

16. The semiconductor device according to

claim 13 wherein the p-type impurity-contained layer is
a boron-contained silicon layer.

17. A method of manufacturing a
5 semiconductor device comprising the steps of:
forming a gate insulating film on a
semiconductor substrate; and
forming a gate electrode including at least a
p-type impurity-contained layer on the gate insulating
10 film,

wherein the step of forming the gate
insulating film includes a step of forming a high-
dielectric-constant film on the semiconductor
substrate, and a step of forming a nitride layer on the
15 top surface of the high-dielectric-constant film.

18. The method according to claim 17 wherein
the nitride layer is formed by introducing nitrogen
into a top surface portion of the high-dielectric-
20 constant film.

19. The method according to claim 17 wherein
the nitride layer is formed by introducing nitrogen
into the top surface portion of the high-dielectric-
25 constant film by plasma nitriding.

20. The method according to claim 17 wherein

the nitride layer is formed by introducing nitrogen into the surface portion of the high-dielectric-constant film by using radical nitrogen.

5 21. The method according to claim 17 wherein the semiconductor substrate is a silicon substrate or a silicon layer.

10 22. The method according to claim 17 wherein the p-type impurity-contained layer is a boron-contained silicon layer.